

Docket No: SA-516

Exhibit No: 3-A

**NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.**

**AIR TRAFFIC CONTROL GROUP CHAIRMAN'S
FACTUAL REPORT**

NATIONAL TRANSPORTATION SAFETY BOARD
Office of Aviation Safety
Washington, D. C. 20594
September 12, 1997

**AIR TRAFFIC CONTROL GROUP CHAIRMAN'S
FACTUAL REPORT**

A. ACCIDENT

NTSB No: DCA-96-MA-070
Location: East Moriches, New York
Date: July 17 EDT or July 18 UTC, 1996
Time: 2031 EDT, 0031 UTC
Aircraft: Trans World Airlines Flight 800, B747

B. AIR TRAFFIC CONTROL GROUP

Chairman: Allen E. Lebo
National Transportation Safety Board

Member: Steven D. Green
Air Line Pilots Association

Member: Robert D'Addario
National Air Traffic Controllers Association

Member: Lori Weber
Federal Aviation Administration

Member: Jim Reilly
Trans World Airlines

C. SUMMARY

On July 17, 1996, at 2031 EDT, a Boeing 747-131, N93119, crashed into the Atlantic Ocean, about 8 miles south of East Moriches, New York, after taking off from John F. Kennedy International Airport (JFK). The airplane was being operated on an instrument flight rules (IFR)

flight plan under the provisions of Title 14, Code of Federal Regulations (CFR), Part 121, on a regularly scheduled flight to Charles De Gaulle International Airport (CDG), Paris, France, as Trans World Airlines (TWA) Flight 800. The airplane was destroyed by explosion, fire, and impact forces with the ocean. All 230 people aboard were killed.

D. DETAILS OF INVESTIGATION

1. Overview

Trans World Airlines Flight 800 (TWA800) departed runway 22 Right at Kennedy International Airport at 0019:00 UTC. The flight contacted departure control at 0020:13 UTC, and was instructed to climb to 11,000 ft. A left turn to heading 150 was issued, and then headings 070 and 050 were subsequently issued for traffic. The flight was then cleared direct to the Bette intersection, and was told to contact Boston Air Route Traffic Control Center (ARTCC). TWA800 contacted that facility at 0024:42 UTC, and was then issued instructions to climb to 13,000 ft. A little later the flight was issued FL190 and told to expedite through 15,000 ft. This altitude was subsequently amended to 13,000 feet because of traffic. When clear of traffic, TWA800 was issued 15,000 ft. Acknowledgment of this instruction was the last transmission, which occurred at 0030:19 UTC.

2. TWA800 History of Flight

At 1 hour and 33 minutes prior to the accident, 2258:01 UTC, the Kennedy Gate Hold controller asked if there were any TWA aircraft on the frequency. TWA800 replied that it was on the frequency. The controller asked if TWA800 would call on the company frequency and tell an Atlanta flight that they just got a release for TWA831. TWA800 acknowledged, and contacted dispatch through the company radio. TWA800 then told the controller that the new departure time for TWA800 would be 2330 UTC. The Gate Hold controller asked TWA800 if it wanted the time changed in the computer, saying that their proposed time had been 2300 UTC and that that time was good for 2 hours. TWA800 replied that they just wanted to update it for the controller's benefit, and that they would be thirty minutes late. The controller then advised the flight to check the current ATIS, to advise on the same frequency when ready to taxi, and to also advise which ramp exit they would be using.

At 0007:51 UTC TWA800 called Kennedy Gate Hold, identified themselves as TWA800 Heavy, adding, "we're a Lifeguard¹ ah, we're ready to taxi out delta." The Gate Hold controller instructed TWA800 to contact ground control on "21.9" for taxi and also instructed the flight to let the ground controller know that TWA800 was a Lifeguard flight.

¹ LIFEGUARD is a term used to refer to civilian air ambulance flights. Air Traffic Controllers are instructed to assist the pilots of air ambulance aircraft to avoid areas of significant weather and turbulent conditions. Controllers are also instructed to comply with pilot requests to provide notifications to expedite ground handling of patients, vital organs, or urgently needed medical materials.

At 0008:21 UTC TWA800 called Kennedy ground control identifying itself as TWA800 heavy lifeguard, saying it was coming out of delta alpha with information tango. The ground controller replied, "...you're a lifeguard today?" The ground controller then added, "you know, every day you come out and we don't know that you're a life guard, and then you tell us you are, and, if you could tell company, ...you know, put that in the flight plan, it would help us out a lot." TWA800 replied, "...you gotta understand, I don't think they knew it either until the last minute." The ground controller then instructed the flight to turn right on alpha, and hold short of echo.

At 0012:04, the ground controller told TWA800 to make a left turn on taxiway echo, behind Carnival (another aircraft), hold short of runway 31 right, and to monitor tower on 123.9. TWA800 acknowledged the transmission.

The local controller, at 0013:39 UTC transmitted "Lifeguard TWA800 heavy, tower, good evening, you with me?" Shortly after this the local controller said I'm going to put you behind British Airways, sir. The company heavy seven six knows to follow you, so... a left at zulu alpha, and follow British." TWA800 acknowledged.

TWA800 was cleared into position and hold at 0017:18 UTC, and was cautioned about wake turbulence from a "departing 757, runway 22 right." About a minute later at 0018:21 UTC TWA800 was cleared for takeoff on runway 22 right, having been issued the wind, 240 at eight. At 0020:00 UTC the local controller told the flight to contact New York departure on 135.9. TWA800 acknowledged.

TWA800 reported to the New York Terminal Radar Approach Control (TRACON), Kennedy Departure Position, that it was leaving 900 feet, climbing to 5,000 ft. The controller stated that the flight was in radar contact, and then instructed the flight to climb and maintain 11,000 ft.

At 0020:45 UTC the Kennedy Departure controller told the flight to turn left heading 150. TWA800 acknowledged. A little more than a minute later, at 0022:01 UTC, the controller gave another instruction to turn to heading 070. TWA800 acknowledged. About 20 seconds later, the controller issued another heading of 050, adding that it was a vector for "climb and around traffic." At 0022:43 the controller pointed out traffic and said, "when you're out of five, I'll have on course." Again, TWA800 acknowledged.

The departure controller told TWA800 to go direct to "Bette" (pronounced as in the name Betty), and to resume its own navigation at 0023:23 UTC. About 10 seconds later the flight was told to contact Boston ARTCC on 132.3. TWA800 repeated the frequency, and wished the controller a good day. About 15 seconds after that transmission, TWA800 reported on the frequency for Boston ARTCC, (Sardi Sector), and reported out of 8,200 climbing to 11,000 ft. The Boston ARTCC controller acknowledged and told the flight to climb and maintain 13,000 ft.

At 0025:31 UTC, the controller asked TWA800 what its rate of climb was. TWA800 reported two thousand feet a minute until accelerating out of ten thousand. The controller then

assigned the aircraft flight level 190, and asked that it expedite through 15,000. Almost a minute later, the controller instructed TWA800 to “stop climb at one three thousand.” Then at 0028:13, the controller issued traffic “at one o’clock and seven miles southbound a thousand foot above, he’s a beech nineteen hundred.” About 2 minutes later, 0030:19 UTC, TWA800 was instructed to climb and maintain 15,000 ft. TWA800 acknowledged the transmission and reported leaving 13,000 ft. This was TWA800’s last transmission to air traffic control.

New York ARTCC radar data showed that the last mode C radar return occurred at 0031:10 UTC, displaying an altitude of 13,700 ft. Boston ARTCC’s last mode C return was at 0031:13 UTC, and New York TRACON’s last mode C radar return was at 0031:12 UTC.

At 0031:50 UTC, another flight in the area, Stinger Bee flight 507 (BBE507), a B737, reported to Boston ARTCC “we just saw an explosion out here.” (At this time BBE507 was at TWA800’s 11:00 position and about 20-25 miles). About 10 seconds later BBE507 said, “we just saw an explosion up ahead of us here, somewhere’s about sixteen thousand feet or something like that, it just went down into the water.” After this, 2 other aircraft confirmed the report. Alitalia 609 reported, “...just ahead of us.” Another flight, Virgin Atlantic 009, said that at their 9 o’clock position, it looked like an explosion about 5 or 6 miles away. (It was actually about 25 miles away). Additional reports from the Stinger Bee flight estimated the explosion at 15,000 ft. Following this report, additional reports were received from multiple aircraft in the Long Island area confirming an explosion.

3. VVAT450 (Navy Alpha Tango 450) Overview

VVAT450 passed immediately south of TWA800, at flight level 200, before the reported explosions. When the explosions occurred, the two aircraft had already passed each other. VVAT450 had originally filed a flight plan to go from Navy Brunswick (NHZ) to Kennebunk (ENE) to Boston (BOS) to Kennedy (JFK) direct Janna Intersection direct Bergh intersection, showing in remarks a VFR delay of 4 hours at Bergh. Subsequent ATC revisions to the flight plan cleared the aircraft over the Hampton VOR (HTO) then via J121, A300, then the Bergh Intersection. The aircraft’s transponder was inoperative enroute to the Bergh intersection, although it had previously been assigned a beacon code of 3567. VVAT450 made no reports on any ATC frequency of having observed the event. While in contact with the NY ARTCC, the pilot inquired if his assistance was needed at the accident site. ATC coordinated with the Coast Guard and VVAT450 returned to the accident area to assist in search and rescue.

Double primary targets appeared on NY and Boston ARTCC data. Boston ARTCC personnel reported that VVAT450 was a “tracked” primary target, meaning that it was being actively monitored by the radar data processing system despite the malfunctioning transponder. There was one transponder return on the NY ARTCC data (code 3567). No other beacon codes or transponder hits appeared from VVAT450’s transponder in the vicinity of the accident. Portions of the flight path of VVAT450 were examined to determine if a point existed at which an additional aircraft or a shadow aircraft would have split off from the flight or could have been

identified. No such primary or radar target was located. At 0051:13 UTC VVAT450 canceled its IFR flight plan, proceeding VFR.

4. VVAT450 History of Flight

At 2341:51 UTC Navy Brunswick called the Boston ARTCC Sardi Sector Radar Controller (R16) saying that he had VVAT450 10 miles south of Brunswick without an operable transponder, going to Bergh for his first fix, and asked, "...gonna be able to work him tonight without it..?" The Associate Position controller then called the R16 radar controller and said to give VVAT450 J174 to intercept Amber 300, "and that does take him to Bergh." R16 then called Navy Brunswick and said that he had routing for VVAT450. R16 also said that he saw VVAT450 35 south of Brunswick, on about the 180 radial. R16 then inquired if he could climb VVAT450 higher and the Navy Brunswick controller approved the request.

VVAT450 reported on R16's frequency at 2348:45 UTC. R16 then issued a clearance to climb and maintain flight level 200, and clearance to the Bergh intersection via direct Boston, J55 Hampton, J121 until joining Amber 300, Bergh. The R16 controller stated radar contact 37 miles south of Brunswick, primary target only. At 2351:28 R16 asked VVAT450 to report reaching flight level 200. VVAT450 reported level at 0000:49 UTC. R16 then issued a point-out to R37, Concord Sector, which was approved. R16 then told VVAT450 to contact the next sector in Boston ARTCC.

At 0006:23 UTC VVAT450 reported to the R47 controller working the Bosox sector. Three minutes later VVAT450 was handed off to the next sector, Providence, Sector 34. VVAT450 reported flight level 200 to the R34 controller, at 0009:50 UTC. VVAT450 then made a position report to R34, stated that they were showing warning area 105 as "cold," and asked if it was possible to go direct to Bergh. The sector 34 controller then called the Sardi sector controller and said that VVAT450 wants to go "direct to Bergh, he's your control, and he has no transponder." At 0019:02 UTC, R34 told VVAT450 that the next sector had the request and issued the frequency for that sector.

VVAT450 contacted the R32 controller, Sardi Sector, at the Boston ARTCC at 0019:25 UTC, asking if she had the request. She replied that she did, but that she was unable to allow the flight to go direct to the Bergh intersection because of conflicting traffic on the Kennedy departure track. She also said that because the flight didn't have a transponder, she'd have to keep the flight on airways. At 0020:22 UTC VVAT450 said "Thanks for trying." She then called the Atlantic sector controller in the New York ARTCC and discussed routing and the fact that VVAT450 had no transponder. The Atlantic Sector controller said that if VVAT450 were going to go VFR, that would not be a problem, and that it would be a problem working him IFR without a transponder. The R32 controller then went back to VVAT450 and asked if they planned to go VFR at the Bergh intersection. VVAT450 replied, "that's affirmative, VFR." At 0033:56 UTC, a pilot that did not identify himself transmitted, "I have 18 or 19 miles from the 236 radial off of Hampton." The controller then transmitted, "...thank you very much sir, we're investigating that right now. TWA800, Center, TWA Eight Zero Zero, if you hear Center, ident."

At 0035:30, the R32 controller told VVAT450 to contact New York Center on 133.05. VVAT450 replied, "switching one three three zero five." After this, a pilot that did not identify himself transmitted, "I think that was him." The R32 controller said, "I think so." The unidentified pilot then said, "God bless him."

At 0035:33 UTC VVAT450 contacted the New York ARTCC, Sector 66 Oceanic, saying that they were at flight level 200, and had a request. They transmitted, "...we'd like to get an IFR descent down then and go VFR operational. We understand there has been a possible accident on the 19 DME from Hampton on the 236. We'd like to go investigate." At 0036:13 UTC they confirmed, "...we would like to get an IFR descent down and then we're going to go VFR operational when uh when we're a thousand below." At 0036:22 UTC the controller transmitted "Navy Alpha Tango 450, maintain present heading, descend and maintain seven thousand, how low do you want to go?" VVAT450 replied (at 0036:29 UTC) "We're down to seven thousand, Navy Alpha Tango 450, and that'll be good for now thanks but we're going to need vectors back to uh back to Navy Hampton." The controller replied, "...where do you need vectors to?" VVAT450 replied, "that's to Hampton if we can get IFR back to Hampton, then we're going to go VFR operational at seven thousand." At 0036:58 UTC the controller replied, "OK, roger, maintain present heading, I have traffic behind you at one six thousand if you can get below fifteen, I can reverse course for you." VVAT450 transmitted, "...we'll get below fifteen." The controller then asked, "what is your altitude?" VVAT450 replied (at 0038:00 UTC) "... Passing through one thousand five hundred at this time, sir, we are just returning to do a possible on a reported explosion in the water. If you have any information that the Coast Guard or someone else is investigating that, contact them and we will not need to do this." The controller replied, "OK, I understand what is your altitude again, did you say one thousand?" VVAT450 replied, "No, now we are one four, one four thousand, fourteen thousand five hundred feet." The controller said, "thank you, turn left heading of 160."

At 0039:37 UTC, the controller asked VVAT450 its altitude. VVAT450 reported passing through 12,000. The controller then reported to VVAT450 that supervisors were checking with the Coast Guard to see if anybody else was investigating. VVAT450 then replied, that if that was the case, they'd proceed with their original plans to Bergh. "We'll level at seven thousand and wait your response. If the Coast Guard is responding then our assistance won't be necessary."

At 0040:28 UTC the controller cleared the flight from present position direct to Bergh, and asked if they wanted to stop at an altitude or continue down to seven. VVAT450 replied, "I don't want to lose comm (communication) with you sir, so if I could level at nine thousand or something like that, that would be good." The controller then assigned the flight 10,000 and issued the current altimeter setting. In reply to a question from the controller, VVAT450 reported that they were 74 miles from Hampton. The controller then said, "we're talking to the Coast Guard now, what was the position that you wanted to investigate?" VVAT450 told the controller the position. The controller then said that there was an aircraft accident, and that the Coast Guard would appreciate their help on channel sixteen. VVAT450 then requested IFR vectors back to the accident site. The controller assigned a heading of 330 and an altitude of 10,000. The controller then asked VVAT450 for their requested altitude. VVAT450 replied that they'd like to descend down to 1,000 ft.

The flight was then assigned 3,000 ft. at 0046:14 UTC, and was told to go direct to Hampton. The controller asked for a position report, because radar contact had been lost. VVAT450 said that their position was 60 miles from Hampton on the 235 radial.

At 0051:04 UTC, VVAT450 reported that they were passing 3,000 ft and said that they'd like to go operational. The controller then replied, "thank you, cleared from the frequency, good day sir." VVAT450 then asked the controller if he could pass on to the Coast Guard that they'd be calling them on channel sixteen.

About 20 minutes later, VVAT450 called the controller back and said that they were leaving the scene of the SAR and would like to proceed with their mission back to point Bergh. They reported their position to the controller as being on the Hampton 245 at 21 DME, at 9,500 ft. The controller then coordinated with the Boston ARTCC Sardi Controller. It was decided that the New York Ocean controller would work VVAT450 although the Boston controller had jurisdiction over the airspace. However, when the New York controller got back to VVAT450, VVAT450 said that they would stay VFR operational with due regard. The New York controller told VVAT450 that the Boston controller had released control for IFR. VVAT450 replied that they would stay "due regard."² VVAT450 transmitted, "good day, sir" at 0111:38 UTC.

About four hours later, VVAT450 requested an IFR clearance back to Navy Brunswick. At 0509:00 UTC, the New York ARTCC Atlantic Sector controller, and the Boston ARTCC Cape Sector controller discussed the position of VVAT450. The flight was not in radar contact, but was proceeding direct to Navy Brunswick. Boston "blocked" flight level 200 for VVAT450, and began "working" the flight from 0516:54 UTC until 0523:43 UTC. VVAT450 was told to contact the Parso Sector of the Boston ARTCC. At 0535 UTC the controller told VVAT450 that it was in radar contact 102 miles southeast of Boston at flight level 200, and was a primary target only. VVAT450 was given descent to 4,000 ft along with a current altimeter setting. The flight was turned over to Navy Brunswick at 0554:22 UTC out of 5,200 feet for 4,000 ft.

5. Aircraft Reporting the Explosion while Airborne

N1182J

This aircraft departed Long Island MacArthur airport (ISP) at 0015:00 UTC. It was initially assigned a transponder code of 0111. At 0027:00 UTC, the aircraft terminated its radar service and was assigned a transponder code of 1200. The pilot reported a "big flame" at 0034:07 UTC. At 0041:54 UTC, N1182J reported witnessing the explosion to New York Flight Service. "...We saw landing lights facing us and all of a sudden it turned into a bright orange flame..." The pilot noted in his report that he had been over Gabreski Airport (FOK) at nine thousand feet when he observed the event. At 0050:08 UTC, this aircraft was assigned a

² DUE REGARD is defined as "a phase of flight wherein an aircraft commander of a State-operated aircraft assumes responsibility to separate his aircraft from all other aircraft."

transponder code of 0132. At 0051:34 UTC, the pilot again reported witnessing the event to the New York TRACON, Calverton/Beads position, seeing “two landing lights facing us in the distance then it turned into an orange ball of flames”.

Jolly 14

The tape from Gabreski Tower (FOK) was barely readable. However, the ATC group was able to discern that Jolly 14 was a helicopter operating out of FOK. This helicopter proceeded to the impact site shortly after the accident. During a return flight to FOK, the pilot queried the FOK tower controller regarding a Piper Navajo. The pilot stated that he believed the colors of the principal wreckage to be red and white, and that there may have been a midair collision involving a Navajo.

STINGER BEE 507

BBE507 reported to the Boston ARTCC, Sardi Sector, about seeing the event at 0031:50 UTC. At 0033:48 UTC this aircraft reported being directly over the site. At 0037:20 UTC the crew of BBE507 reported that they had observed what they thought was a landing light at about fifteen thousand feet and had responded by selecting their own landing lights on, which was immediately followed by the explosion.

PIEDMONT 3112

PDT3112 reported seeing a flash and falling debris. This was reported to the New York TRACON, Beads Position, at about 0031:58 UTC.

ALITALIA 609

AZA609, reported to Boston ARTCC, Sardi Sector, that the event occurred ahead of them at 0032:10 UTC. At 0033:36 UTC, the crew reported overhead the impact site. They reported this position as 48 miles from JFK on the 102 degree radial.

N41142

N4112 reported to the New York TRACON, Calverton Position, seeing a big flame at 0032:17 UTC. The pilot reported, “yeah, we just saw a big flame in the air, just south of Smith’s Point, something was coming down out of the air, probably about from about three thousand feet and it went down to the ground.”

Virgin Atlantic 009

VIR009 reported seeing an explosion, at his 9 o'clock position about 5 or 6 miles away to the Boston ARTCC, Sardi Sector, at 0032:25 UTC.

N9288K

N9288K reported to the New York ARTCC, Calverton Position, at 0032:33 UTC, "...eight eight kilo also saw it."

N2084C

N2084C reported to New York ARTCC, Calverton Position, "eight four Charlie saw it" at 0032:39 UTC.

BTA3678

Continental Express 3678, reported to the New York TRACON, Liberty East Position, that he observed a "big fireball" at 0032:52 UTC.

6. SECONDARY EXPLOSION REPORT

At 0045:51 UTC a Piper Cherokee N98360 reported to the New York TRACON Calverton position that they were at 3,500 feet, "over that site where we saw a large explosion, something is still burning in the ocean." Additionally, the aircraft reported, at 0046:17 UTC that they "saw a large explosion that went up at least two hundred feet so we don't know if it came from the air or the ground."

7. OTHER SOUNDS & REMARKS ON VOICE COMMUNICATION TAPES

At 0041:27 UTC and again at 0041:37 UTC, an Emergency Locator Transmitter signal was heard on the New York Flight Service Station frequency.

The tape from Gabreski Tower (FOK) was barely readable. However, the ATC group was able to discern a report on the tape of a pilot who reported a power boat proceeding west from the vicinity of the impact site. The identification of the aircraft was not clear. (See Section 10 of this report, Gabreski Tower Transcript).

On the New York ARTCC R66 tape, 0055-0115 UTC, "Transitioning to black jack in a couple of seconds. Sorry I'm a little late guys. Transitioning, we're waiting right now, --we're over. We're over. Transition to black jack now." New York ARTCC had 2 communication systems available, one having yellow plug-in jacks & the other having black plug-in jacks. They were transitioning from the yellow jacks to the black jacks.

On the New York Tracon Calverton tape, at 0047:51 an unidentified aircraft transmitted "...additional information for ground personnel, there is debris scattered at least a mile up to a mile from the actual site."

On the New York Tracon Beads tape, an unidentified aircraft transmitted, "...Looks like a vessel on fire, and the helicopter is right over it. The controller asked, "All right who am I talking to, now?" The pilot transmitted, "Oh, this is just a VFR ship, uh, in the area."

8. Air Traffic Personnel Interview Summary

Mr. David Allen was the controller that was working TWA800 when the accident occurred. Following is a summary of his response to questions:

His EOD date with the FAA was in March, 1987. After completing initial air traffic control training at Oklahoma City, he was assigned to Indianapolis ARTCC. He was there from June 1987 till October of 1994, when he transferred to the Boston ARTCC. He has been assigned to Area C at the Boston ARTCC since he reported there. His operating initials are "VI."

At the time of the accident he was working the Sardi (R32) and Erick (R33) Radar positions combined, with the assistance of a data person. He characterized his workload as moderate and the traffic flow as being normal. His radar appeared to be functioning normally. When he assumed the combined position, TWA800 was already on the frequency and was climbing through 11,500 ft.

The lower limits of his airspace in the area of the accident are 7000 ft and the upper limits are 19,000 ft. When asked about primary targets in the lower stratum of his airspace in the Sardi sector, he said that he could not recall specifically ever starting a track on a primary target at 7000 ft. However, he could recall tracked targets started by others, but none specifically. Additionally, he had no knowledge of boats ever being depicted on his radar.

His altitude filter limits were set from 4,800 ft. to 28,200 ft.

He believed the position is automatically adapted to display 1200 codes (VFR) and that he observed no 1200 codes in the vicinity of TWA800.

Prior to the accident he noted there was no unusual activity in his sector and that all operations appeared perfectly normal to him.

Lori Siebert was the controller working the Sardi Sector immediately prior to David Allen. In response to questions she indicated the following:

Her EOD date with the FAA was on September 26, 1989. Prior to this, she had no ATC experience. She came to Boston ARTCC in January of 1990, and has remained at that facility. Her operating initials are "RE."

The Sardi sector was combined with the Erick sector. In the area of TWA800's flight path, her sector owned from 7,000 ft to FL190.

Before being relieved by David Allen, the workload was "light to moderate."

The predominate traffic flow in the Sardi sector is JFK departures, eastbound, overseas; and Long Island departures and arrivals.

The radar was functioning "normally." She didn't recall the altitude when she accepted the handoff on TWA 800 from New York TRACON.

In her first communication with TWA800, she "stopped" TWA800 at 13,000 feet because of Air Shuttle 5523 (ASH5523). She also later issued a climb to FL190, to expedite through 15,000 because of ASH5523.

Most of the relief briefing with David Allen was spent discussing separation between the two aircraft. Winds and weather were also discussed. They discussed stopping TWA800 at 13,000 ft. When David Allen took over the sector he issued "thirteen thousand only for now" to TWA800.

There was a conflict alert for the two aircraft on the display. She had been expecting to get a conflict alert.

When asked if she saw any primary targets in the vicinity of TWA800, she replied, "not that I can remember."

She categorized all operations observed on the display as "normal."

She observed no unusual activity in the sector.

Raymond Taheny was the New York ARTCC Automation Manager. In response to questions he provided the following information:

He had been in the FAA for 28 years. Mr. Taheny had worked in automation from 1973-1981, and then again as Automation Manager from 1990 to present.

In the area of the accident, sort boxes (NY ARTCC) 3290 and 3291 were utilized.³

Radar sites are classified and treated as preferred radar sites and supplemental sites. For box 3290 the preferred site is Riverhead, and the supplemental site is Trevoise. For box 3291 the primary site is Riverhead and the supplemental site is Hartford.

The National Track Analysis Program (NTAP) data does not provide a method of determining which site is providing information to the computer. The switch from preferred site to supplemental is an automatic one. If two consecutive returns are missed by the preferred site, the supplemental site is then utilized. The switch from preferred site to the supplemental site occurs on a target-to-target basis.

Primary radar data is only displayed from the preferred site.

If a primary target is in the tracked status, it is possible that both the smoothed, computer-generated target, and the actual primary will be displayed on the NTAP data.

Each sort box has an area of 16 square miles.

80 Azimuth change pulses (ACP's) are needed in order to classify a target as a long run length primary target. A return less than this will result in a target called a short run length target (short run length targets are displayed as "periods", and long run length targets are displayed as "plus" signs).

³ ARTCC radar coverage areas are divided into a grid of 16 mile squares called "sort boxes." Each box is assigned a unique number. Radar coverage for each sort box is provided by one or more radar sites designated as "preferred" and "supplemental." Radar data from the preferred site is used under normal circumstances, with data from the supplemental site displayed as necessary to compensate for occasional loss of expected information from the preferred site.

Mr. Lee Rodels was working the Atlantic Sector of the Boston ARTCC when VVAT450 called on his frequency and requested to return to Brunswick. He first entered on duty with the FAA in 1986 at the Los Angeles ARTCC. He transferred to the New York ARTCC in 1990, and has been there since that time. Following is a summary of his response to questions:

His operating initials are “ZR.”

He had received a message from the watch supervisor that VVAT450 was overdue for his expected return from the VFR segment of his flight, and if VVAT450 contacted his sector, to tell the pilot to call the appropriate military facility. ” When VVAT450 contacted him, he passed that information to the pilot.

When VVAT450 contacted him he was unable to establish radar contact with VVAT450 as a primary (skin paint) target. It was common in this area to not “see” an aircraft. At a later point he saw intermittent transponder returns for the flight.

VVAT450 had contacted him about 2 minutes before the start time on the Boston ARTCC Cape Sector. (The start time of the transcript was 0508:59 UTC.)

The pilot reported that his VOR equipment was not functioning. He did not consider this to be unusual for military aircraft.

He recalled that his only concern at the time was that VVAT450 was not “where he said he was.” He received a position report from VVAT450 in latitude and longitude but couldn’t locate the aircraft. He arranged to block flight level 220 non-radar with Boston ARTCC.

He again said that he did not consider it unusual that he could not locate a primary target for VVAT450.

P3’s normally work in what he referred to as the “IBEX” Block, which then gets different names for whatever operation is taking place.

The pilot did not sound anxious. The transmissions did not contain any sounds that he considered to be out of the ordinary.

9. Transcripts B-L1

1. Kennedy Air Traffic Control Tower Gate Hold Position. (B-1) 5 pages
2. Kennedy Air Traffic Control Tower Ground Control Position (B-2) 2 pages
3. Kennedy Air Traffic Control Tower Local Control Position (C) 3 pages
4. New York TRACON, Kennedy Departure Position (D) 13 pages

5. New York TRACON, Kennedy Departure Hand-off (E) 5 pages
6. New York TRACON, Watch Supervisor Position (F) 5 pages
7. New York TRACON, Area Manager In Charge Position (G) 3 pages
8. New York TRACON Calverton Position (H) 27 pages
9. New York TRACON Hampton Coordinator Position (I) 7 pages
10. New York TRACON Beads Position (J) 24 pages
11. New York TRACON Liberty East Position (K) 14 pages
12. Boston ARTCC Sardi Sector Position (L) 25 pages
13. New York AFSS (L-1) 7 pages

10. Gabreski Tower “Transcript” (FOK) (L-2) 11 pages

This “transcript” was produced in its final form on 2/4/97. The Alternate Contract Manager of Gabreski Tower did the first draft, and because of the quality of the recording, there were many, many blank spots in the transcript. He then gave the first draft of the “transcript” to the Project Manager, who in turn went to the controllers who were working on the night of the accident, and asked them to fill in the blank spots by recalling what had been said. Rather than a verbatim transcription of voice communications at a particular position, this is a summary of communications at all positions, arranged in chronological order. It represents the work and recall of many individuals.

11. Transcripts L-3 to L-9

1. Boston ARTCC Parso Sector Radar L-3 8 pages
2. Boston ARTCC Bosox Sector Radar L-4 2 pages
3. Boston ARTCC Providence Sector Radar L-5 3 pages
4. Boston ARTCC Sardi Sector Radar L-6 6 pages
5. New York ARTCC Oceanic Radar L-7 15 pages
6. Boston ARTCC Cape Sector Radar L-8 5 pages
7. Boston ARTCC Parso Sector Radar L-9 4 pages

12. ATC Group Flight Track Depictions (M) 7 pages

During the on-scene phase of the investigation, the ATC Group generated flight track depictions and distributed these for the use of other groups at various progress meetings. The original source of these depictions was New York ARTCC NTAP.

13. Radar Antenna and Sort Box Information (N) 4 pages

The preferred radar site for both the New York ARTCC and Boston ARTCC sort boxes covering the area where TWA800 crashed was the Riverhead antenna, located at 40° 52' 42”

north & 072° 41' 16" west. Within New York ARTCC, the flight track was associated with two sort boxes, 3290 and 3291. The supplemental antenna for sort box 3290 was the Trevoise radar site, and the supplemental or backup antenna for sort box 3291 was Hartford.

In Boston ARTCC, all of the flight track was within one sort box, which used Hartford as the supplemental or backup antenna.

Four pages depict:

1. Location of radar sites
2. Preferred vs. supplemental ZNY Antennas.
3. New York ARTCC sort boxes in which the accident occurred
4. Boston ARTCC sort box locations and radar location.

14. Sardi Sector (O) 1 page

The accident occurred within the Sardi sector of the Boston ARTCC.

The page depicts the Sardi sector in Boston.

15. FAA Chronological Summary of Flight (P) 2 pages

16. Special Use Airspace (Q) 3 pages

In the time frame of this accident, the closest area in use was designated as Altitude Reservation (ALTRV) "Tango Billy." Its closest point was about 50-60 miles south of the accident site. The ALTRV was scheduled from 180100Z to 180700Z, July, '96. VVAT450 was en route to this block of airspace when the accident occurred.

17. Flight Progress Strips (R) 5 pages

Flight Progress Strips of nine IFR aircraft in the vicinity of TWA800 showing their routing, aircraft type, and transponder code for each flight.

18. Weather Information

A balloon was released at 0023:17Z on July 17th, '96, at Upton, N.Y. Data were received once a minute as the balloon ascended. The winds at 0023:32 Z at 13,451 ft msl were 297 degrees at 18 knots.

Weather Observation: ISP2350Z 2204/CLR/27/23/3005/181

(NOTE: for additional information see NTSB Meteorologist's Factual Report.)

19. Conflict Alert (S) 1 page

A Data Analysis Reduction Tool (DART) showed that a conflict alert existed between TWA 800 and ASH5523, a Beech 1900, from 0026:07.2 UTC until 0026:55.2 UTC. The closest actual proximity was 800 feet and 3.9 miles. TWA800 had been assigned 13,000 feet and ASH5523 had been assigned 14,000 feet.

20. Additional Boston ARTCC Data (T) Five pages

- a. Accident Notification Record from Boston ARTCC
- b. Personnel Statements
- c. Boston ARTCC Chronological Summary of Flight

21. Megadata Corp. (U) One page

The ATC Group visited Megadata Corp. located on Long Island in Bohemia, New York. This company provides customers such as air carriers with a display of aircraft positions, generally inbound to a terminal area. This enables air carriers to know on a general basis, not precisely as in air traffic control, where each of their aircraft are located and is used for tasks such as estimating exact arrival times, which in turn helps in determining gate assignments. All aircraft within a given distance of their fixed antennae array can be depicted if the transponder return received by the array is of sufficient strength.

The ATC Group asked the Vice President of Research & Development at Megadata Corp. to show a depiction of all of the aircraft in a 20-30 mile radius of the last transponder return received by TWA800, and then reproduce it on a piece of paper. One page shows this depiction. The flight track of each aircraft consists of a bold black dot representing an aircraft position at the time of TWA800's last transponder return. The lighter dots prior to that represent the target trail of that aircraft. Roughly, each target shows a trail of 12 "hits," each "hit" occurring every 4.70 seconds. The Megadata Corp. system is "slaved" to the ASR terminal radar antenna located at Long Island MacArthur Airport.


The ATC group wrote on this depiction in pencil, from memory, the call signs of the aircraft that we thought were in a position to perhaps have seen the explosion of TWA800. The Chairman of the Operations Group had requested that we do this so that they could ask the flight

crews of these aircraft what they had seen. Therefore, this depiction was intended simply as an aid in the location of flight crews. The relative positions of the various aircraft may be slightly different than that depicted by air traffic control radar data.

Megadata Corp. reported that their radar data was also used for search purposes by the U.S. Navy during the very early stages of the investigation, until other radar data became available.

22. FAA Radar Data

During the on-scene investigation, ARTCC NTAP radar data originating from the site at Riverhead was viewed by the Air Traffic Control Group for unidentified radar tracks that would have crossed the path of TWA800 at a critical time. No unidentified tracks were found. The group viewed an FAA tape titled "Retrack," containing N.Y. TRACON terminal radar data from the site at JFK, looking for unidentified radar tracks that would have crossed the path of TWA800 at a critical time. None were found. This tape was also played at a Group Progress Meeting (also on-scene). For additional information on radar data see the Airplane Performance Study, Exhibit 13A.



Allen E. Lebo
Air Traffic Control
Group Chairman

